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Re-evaluation Note

REV2010-09

Metam Sodium and Metam Potassium – Proposed Mitigation Measures

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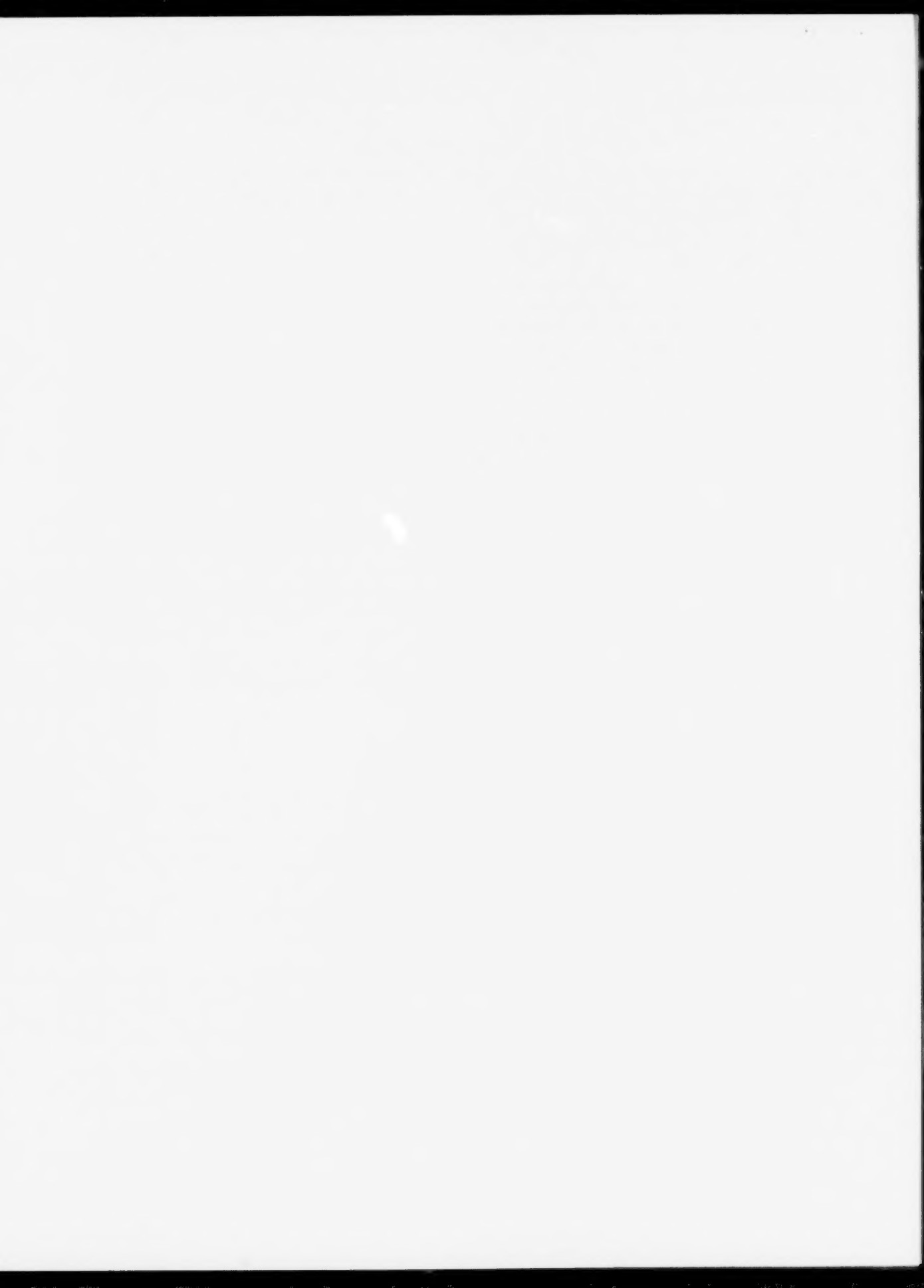
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1.0 Background

Metam sodium and metam potassium are under re-evaluation by Health Canada's Pest Management Regulatory Agency (PMRA) and are two of the active ingredients included in the soil fumigant cluster. The purpose of this Re-evaluation Note is to notify registrants, pesticide regulatory officials, and the Canadian public of proposed label amendments for the products containing metam sodium or metam potassium.

Common Name	Chemical Name		CAS Registry Number
	International Union of Pure and Applied Chemistry (IUPAC)	Chemistry Abstracts Service (CAS)	
Metam sodium	Sodium methylthiocarbamate	Sodium N-methylthiocarbamate	137-42-8
Metam potassium	Potassium N-methylthiocarbamate	Carbamic acid, N-methylthio-monopotassium salt.	137-41-7

Metam sodium and metam potassium are non-selective pre-plant soil fumigants and antimicrobial agents. Upon application, metam sodium and metam potassium are broken down into several degradates; the primary being methyl isothiocyanate. In Canada, metam sodium and metam potassium are currently registered for use as soil fumigants for control of nematodes, fungi and weed seeds in open land, nurseries and greenhouses. The end-use products, formulated as solutions and an emulsifiable concentrate, are applied and incorporated into soil as a broadcast or row treatment using chisels, chemigation, soil-cover, rotary tiller, and sprinkling cans. The soil is sealed using a tarp, roller or press sealer, and is aerated prior to planting. Metam sodium is also registered as a remedial wood preservative used to treat structural timber (for example, poles). The end-use products are formulated as a solution and an emulsifiable concentrate which are injected into pre-drilled holes and sealed with treated wood plugs. In addition, metam sodium is registered for use in sewer lines to control fungi, bacteria and tree roots. The end-use products are formulated as solutions and sprayed on the inside surfaces of the pipes. Metam potassium is also registered as an antimicrobial agent for control of microbial activity in water cooling systems, secondary petroleum recovery waters, and pulp and paper mills. The end-use products are formulated as solutions that are added directly to the systems. Appendix I lists all currently registered products in Canada for metam sodium and metam potassium.

2.0 Proposed Regulatory Strategy

The PMRA is requiring registrants of products containing metam sodium or metam potassium to implement mitigation measures to limit user exposure and to further protect bystanders and the environment. The implementation of these mitigation measures is considered to be a first step in the re-evaluation of the Canadian uses of the products containing metam sodium or metam potassium.

The measures are consistent with measures adopted by the United States Environmental Protection Agency (USEPA) in their Re-registration Eligibility Decision (RED) documents (2008) and amended RED documents (2009) for metam sodium, metam potassium and methyl

isothiocyanate, and the USEPA Fumigant Management Plans and Post-application Summary Reports Fact Sheet (2010). These mitigation measures are also intended to increase consistency across all Canadian product labels. The PMRA is aware that the USEPA assessment of metam sodium/metam potassium is ongoing, and may re-assess as required.

The proposed mitigation measures include the requirement for a site-specific Fumigation Management Plan prior to any fumigation with metam sodium and metam potassium. The registrants are required to develop, in consultation with the PMRA, a product stewardship program for the soil fumigant uses of metam sodium and metam potassium. A key component of the stewardship program is the development of a Fumigation Management Plan guidance document. It is proposed that this Fumigation Management Plan guidance document be part of an applicator's manual distributed with the product.

The present Re-evaluation Note addresses the proposed label amendments for the end-use products containing metam sodium and metam potassium, as well as the Fumigation Management Plan requirements for the soil fumigant uses. Appendix II lists all required label amendments for products containing metam sodium and metam potassium. Appendix III outlines the minimum requirements that must be included in the Fumigation Management Plan.

3.0 Supporting Documentation

PMRA documents are available through the Pest Management Information Service, phone: 1-800-267-6315 within Canada or 1-613-736-3799 outside Canada (long distance charges apply); fax 613-736-3798; e-mail pmra.infoserv@hc-sc.gc.ca.

The USEPA RED documents for metam sodium and metam potassium are available on the Office of Pesticide Programs' website at www.epa.gov/pesticides/reregistration.

4.0 Next Steps

The PMRA will accept written comments on this proposal up to 60 days from the date of publication of this document. Please forward all comments to Publications (please see contact information indicated on the cover page of this document). The PMRA will consider all comments received from the public in response to this consultation document, and will then publish a follow-up document which will include implementation details.

Appendix I List of Products Currently Registered for Metam Sodium and Metam Potassium (discontinued products excluded).

Table 1 Registered Metam Sodium Products as of 24 January 2010.

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Registered Use	Guarantee
18627	Technical	Buckman Laboratories of Canada, Ltd.	SNMDC (33%) Liquid Microbicide Concentrate	Solution	-	33 %
19399	Technical	Amvac Chemical Corporation	Vapam Technical	Solution	-	44 %
24327	Technical	Buckman Laboratories of Canada, Ltd.	SNMDC Concentrate Liquid Microbicide	Solution	-	42 %
28170	Technical	Taminco Inc.	Metam Sodium Technical Formula	Solution	-	42 %
28323	Manufacturing Concentrate	Taminco Inc.	Metam Sodium MUP Formula	Solution	-	42 %
6453	Commercial	Amvac Chemical Corporation	Vapam Liquid Solution Soil Fumigant	Solution	Soil Fumigant	380 g/L
13139	Commercial	Amvac Chemical Corporation	Pole-Fume	Solution	Wood treatment	380 g/L
15123	Commercial	Douglas Products and Packaging	Sanafoam Vaporooter II	Solution	Sewer lines	24.25 %
17110	Commercial	North Star Structural Contractors, Ltd.	Woodfume	Solution	Wood treatment	380 g/L
19343	Commercial	Univar Canada, Ltd.	Guardsman Post & Hole Fumigant	Solution	Wood treatment	380 g/L
19421	Commercial	Buckman Laboratories of Canada, Ltd.	Busan 1020	Solution	Soil Fumigant	33 %
25000	Commercial	Buckman Laboratories of Canada, Ltd.	Busan 1020W	Solution	Wood treatment	33 %
25103	Commercial	Buckman Laboratories of Canada, Ltd.	Busan 1236	Solution	Soil Fumigant	42 %
28247	Commercial	Taminco Inc.	Metam Sodium Agricultural	Emulsifiable Concentrate	Soil Fumigant and Wood treatment	380 g/L

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Registered Use	Guarantee
29128	Commercial	Amvac Chemical Corporation	Vapam HL	Liquid	Soil Fumigant	42%
29142	Commercial	Taminco Inc.	Memasol 510	Solution	Soil fumigant and Wood treatment	41.98%

Table 2 Registered Metam Potassium Products as of 24 January 2010.

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Registered Use Type	Guarantee
18592	Technical	Buckman Laboratories of Canada, Ltd.	PNMDC (54%) Liquid Microbicide Concentrate	Solution	-	54%
18931	Commercial & Manufacturing Concentrate	Buckman Laboratories of Canada, Ltd.	NABE-M Liquid Microbicide	Solution	Pulp /paper & petroleum industries and water cooling systems	20.3%
12009	Commercial	Buckman Laboratories of Canada, Ltd.	BUSAN 882 Liquid Microbicide	Solution	Pulp /paper & petroleum industries	17.5%
15529	Commercial	Buckman Laboratories of Canada, Ltd.	BUSAN 881 Liquid Microbicide	Solution	Pulp/paper & petroleum industries	20.3%
17025	Commercial	Pace Chemicals, Ltd.	MICROCIDE L-50 Algae Bacteria & Fungi Control Agent	Solution	Water cooling systems	5.07%
17907	Commercial	M-CHEM Industries Corporation	WT 630 Broad Spectrum Liquid Microbicide	Solution	Water cooling systems	6.8%
20251	Commercial	Aquarian Chemicals Inc.	AQUARIAN C434	Solution	Water cooling systems	10.15%
20925	Commercial	IPAC Chemicals, Ltd.	IPACIDE LWT 516	Solution	Water cooling systems	5.07%
20935	Commercial	Buckman Laboratories of Canada, Ltd.	DK-17.5 Liquid Microbicide	Solution	Water cooling systems and petroleum industry	10.15%
20936	Commercial	Buckman Laboratories of Canada, Ltd.	DK-11.7 Liquid Microbicide	Solution	Water cooling systems and petroleum industry	6.8%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Registered Use Type	Guarantee
20937	Commercial	Buckman Laboratories of Canada, Ltd.	DK-8.75 Liquid Microbicide	Solution	Water cooling systems and petroleum industry	5.07%
21689	Commercial	ControlChem Canada, Ltd.	CONTROL CHEM 2602 Liquid Microbicide	Solution	Water cooling systems	5.07%
22475	Commercial	Water Energy Technologies	WETCIDE 4312 Liquid Microbicide	Solution	Water cooling systems	6.8%
23830	Commercial	Buckman Laboratories of Canada, Ltd.	DK-14 Liquid Microbicide	Solution	Water cooling systems and petroleum industry	8.12%
23990	Commercial	Pace Chemicals, Ltd.	MICROCIDE LB-64	Solution	Water cooling systems	8.1%
24038	Commercial	Buckman Laboratories of Canada, Ltd.	BULAB 6003 Liquid Microbicide	Solution	Water cooling systems and petroleum industry	8.12%
24231	Commercial	Jacklyn Industries Inc.	WC 8306 Liquid Microbicide	Solution	Water cooling systems and petroleum industry	10.15%
24232	Commercial	Jacklyn Industries Inc.	WC 8307 Liquid Microbicide	Solution	water cooling systems and petroleum industry	5.07%
25124	Commercial	Buckman Laboratories of Canada, Ltd.	BUSAB 1180	Solution	Soil fumigant	54%
27373	Commercial	Glengarry Chemicals, Ltd.	GLENGARRY MB-1000 Liquid Microbicide	Solution	Water cooling systems and petroleum industry	6.8%
28156	Commercial	State Chemical, Ltd.	FORMULA 410C Algaecide	Solution	Water cooling systems and petroleum industry	10.15%

Appendix II Proposed Label Amendments for Products Containing Metam Sodium or Metam Potassium.

The label amendments presented below do not include all label requirements for individual end-use products, such as first aid statements, disposal statements, precautionary statements and supplementary protective equipment. Additional information on labels of currently registered products that contradicts the amendments noted below should be removed from the labels.

The labels of products in Canada containing metam sodium or metam potassium must include the following label amendments to further protect workers, bystanders and the environment.

Commercial Class Products

All end-use products containing metam sodium and metam potassium for soil fumigant uses must be classified as Restricted Class Products.

1.0 Restricted Classification

The following statements must be included on the primary display panel of the labels registered for soil fumigant uses:

RESTRICTED PRODUCT

**READ THE ENTIRE LABEL AND GUIDANCE FOR PREPARATION OF
A FUMIGATION MANAGEMENT PLAN BEFORE USING**

**THIS PRODUCT CAN ONLY BE USED IN CONJUNCTION WITH A
DETAILED FUMIGATION MANAGEMENT PLAN**

The following statements must be included in the NATURE OF RESTRICTION section of the labels registered for soil fumigant uses:

This product is only to be used by individuals holding an appropriate pesticide applicator certificate or license recognized by the provincial/territorial pesticide regulatory agency where the pesticide application is to occur.

This product is accompanied by an approved label and Guidance for Preparation of a Fumigation Management Plan. READ AND UNDERSTAND THE ENTIRE LABELLING.

2.0 Fumigation Management Plan

The following statements must be included on labels registered for soil fumigant uses in a section entitled FUMIGATION MANAGEMENT PLAN:

A Fumigation Management Plan is an organized, written description of the required steps involved to help ensure a safe, legal and effective fumigation.

The supervising fumigant handler is responsible for working with the owners and/or responsible employees of the site to be fumigated to develop and follow a Fumigation Management Plan. All plans should reflect the experience and expertise of the applicator and circumstances at and around the site and/or area.

In addition to the plan, the applicator must read the entire label and the Applicator's Manual, and follow its directions carefully. If the applicator has any questions about the development of a Fumigation Management Plan, contact the supplier for further assistance.

The Fumigation Management Plan and related documentation, including monitoring records, must be maintained for a minimum of 2 years.

Before any fumigation begins, handlers must be familiar with and comply with all local/provincial/territorial/federal laws and regulations.

3.0 Rate Reduction

The maximum application rate for metam sodium and metam potassium soil fumigation uses must be reduced to 359 kg of active ingredient per hectare.

4.0 Clarification of Supported Uses

All products that include soil fumigant uses must include a complete list of the specific supported crops. General uses, such as "food and fibre crops" are insufficient.

5.0 Label Amendments Pertaining to Basic Hygiene

Add to PRECAUTIONS:

Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

Remove clothing immediately if pesticide comes in contact with skin through soaked clothing or spills. Then wash skin thoroughly and put on clean clothing. Wash contaminated clothing separately from other clothes before reuse.

Store personal protective equipment out of reach of children and pets.

Avoid touching 'clean' surfaces while wearing personal protective equipment (for example: steering wheel, door handles, counter tops), or thoroughly clean these surfaces afterwards with water and detergent.

Remove personal protective equipment immediately after handling this product. Remove personal protective equipment in a pre-determined area separate from living or working areas.

Wash the outside of the gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Avoid touching eyes and face until you have washed your hands.

Never use the mouth to siphon product from containers or to blow out clogged lines, nozzles, etc.

Respirators should be stored in a sealed plastic bag until the next use, to preserve the life of the filter. Regularly change respirator cartridge filters.

Repair/replace torn or broken personal protective equipment.

Treat all clothing worn during pesticide use as contaminated, and handle with chemical resistant gloves.

Use hot water, heavy-duty liquid detergent, the highest water level setting, and the longest wash cycle. Keep and wash personal protective equipment separately from other laundry.

If heavily soiled, wash personal protective equipment two or three times. After washing, run the washing machine through a complete cycle with detergent. If possible, line-dry the clothing.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers must be in the area during application.

6.0 Label Amendments and User Safety Requirements to Further Protect Workers and Bystanders

Add to DIRECTIONS FOR USE:

*For the use in cooling water towers of **metam potassium** products:*

A metering pump system must be used when applying this product.

Add to PRECAUTIONS:*For the use in cooling water towers of **metam potassium** products:*

Wear long pants, a long-sleeved shirt, boots and socks, chemical-resistant gloves, and goggles or a face shield during mixing, loading, application and all other handling activities.

*For all other antimicrobial uses of **metam potassium** products:*

Wear long pants, long sleeves, boots and socks, and chemical-resistant gloves during mixing, loading, application or all other handling activities.

*For all antimicrobial uses of **metam sodium** products:*

Wear long pants, long sleeves, boots and socks, and chemical-resistant gloves during mixing, loading, application or all other handling activities.

*For sewer uses of **metam sodium** products:*

Wear coveralls over long-sleeve shirt and long pants, chemical resistant gloves, chemical-resistant footwear plus socks, chemical-resistant apron if transferring or loading the product or cleaning up spills or equipment, and a respirator during mixing, loading, transfer, application or any other handling activities. The respirator must be a NIOSH-approved half-face, full-face, or helmet/hood style respirator with either, an organic-vapour-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G). In addition, wear face-sealing goggles if using a half-face respirator.

All sewer fumigant support personnel who remain outside the treatment zone and who are not exposed to either liquid spray or vapours must wear long-sleeved shirt, long pants, and shoes plus socks. In addition, when they may be exposed to liquid spray or vapours, they must be provided, have immediately available, and must wear in an emergency, the handler PPE listed in this section.

Applicators must notify downstream waste water treatment facilities prior to start of Metam sodium applications so that they may monitor the operations of the wastewater treatment plant.

Engineering Controls for Closed Loading and/or Transfer Systems

Mixers and loaders must use a system capable of removing the pesticide from the shipping container and transferring it into tanks and/or application equipment. At any disconnect point, the system must be equipped with a dry disconnect or dry couple shut-off device that is warranted by the manufacturer to minimize drippage. Handlers must wear the personal protective equipment required in the PPE section of this labelling for mixers and loaders.

Applicators must use an application nozzle designed to propel the application hose through the sewer using water-jetting capabilities. The nozzle should be designed to allow water to escape under pressure and thereby creating a rocket like effect that propels the nozzle forward while preparing the roots and the pipe for the application of herbicide. Once the hose and nozzle have arrived at the beginning of the application location the applicator will turn off the water pressure and the spring-loaded nozzle will switch to the foaming application.

For all soil fumigant products:

Persons engaged in any of the following activities are defined as fumigant handlers:

- persons participating in the application as supervisors, loaders, drivers, tractor co-pilots, shovelers, cross ditchers, or as other direct application participants (application starts when the fumigant is first introduced into the soil and ends after the fumigant has stopped being delivered/dispensed/injected to the soil);
- persons using devices taking air samples to monitor fumigant air concentrations;
- persons cleaning up fumigant spills (this does not include emergency personnel not associated with the fumigation application);
- persons handling or disposing of fumigant containers;
- persons cleaning, handling, adjusting, or repairing the parts of fumigation equipment that may contain fumigant residues;
- persons installing, repairing, operating equipment in the fumigant application block or surrounding buffer zone during the re-entry interval;
- persons entering the application site or surrounding buffer zone during the re-entry interval to perform scouting, crop advising, or monitoring tasks; and,
- persons installing, perforating (cutting, punching, slicing, poking), removing, repairing, or monitoring tarps. NOTE: see the *Tarp Perforation and/or Removal* section on this label for requirements about when tarps are allowed to be perforated and removed.
- persons outside the perimeter of the buffer zone who monitor fumigant air concentrations.

All fumigant handlers must wear appropriate personal protective equipment in accordance with the provincial/territorial pesticide regulatory agency where the pesticide application is to occur; including at minimum:

- long-sleeved shirt and long pants,
- chemical-resistant boots and socks
- chemical-resistant gloves when handling liquid or emulsifiable concentrate, and
- chemical-resistant apron when handling liquid or emulsifiable concentrate

Handlers who may be exposed to liquid spray while repairing a malfunctioning chemigation system or shutting off equipment must wear:

- chemical-resistant coveralls,
- chemical-resistant gloves,
- chemical-resistant footwear plus socks,
- chemical-resistant headgear, and
- respirator and eye protection of the type specified in the eye and respiratory section in the PPE requirements on this label.

Except as required above, handlers transferring or loading liquid formulations, handlers operating motorized ground equipment with open cabs, handlers applying with hand-held application equipment, handlers repairing or inactivating irrigation or chemigation equipment during application, and handlers cleaning up spills or equipment, must wear:

- coveralls over long-sleeve shirt and long pants,
- chemical-resistant gloves,
- chemical-resistant footwear plus socks,
- chemical-resistant apron if transferring or loading the fumigant or cleaning up spills or equipment, and
- respirator and eye protection of the type specified in the eye and respiratory section in the PPE requirements on this label.

See the *Engineering Controls* section for more options.

Some materials that are chemical-resistant to this product are [registrant inserts correct chemical-resistant material].

Eye and Lung Protection

- Wear protective eyewear (for example, full-face shield or safety glasses when handling liquid. DO NOT wear goggles).
- When a respirator is required, fumigant handlers must wear at a minimum either:
 - a full-face respirator with an organic-vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or
 - a full-face respirator with a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G).

Respirators must fit properly. Any obstruction to a proper fit should be removed (for example, beard, long sideburns).

IMPORTANT: An air-supplying respirator [i.e., a respirator connected directly to a clean air source or a self-contained breathing apparatus (SCBA)] is not permitted for routine fumigant handler tasks. Such respirators are only permitted in emergencies such as a spill or leak or when corrective action is needed to reduce air concentrations of MITC to acceptable levels.

Respirator Availability:

The supervising fumigant handler must confirm and document in the Fumigation Management Plan at least one air rescue device (for example, SCBA) is on-site and is ready for use in case of an emergency.

The supervising fumigant handler must confirm and document in the Fumigation Management Plan that an air-purifying respirator and appropriate cartridges of the type specified in the *Personal Protective Equipment* section of this labeling are immediately available for each handler who will wear one.

At a minimum, one handler must have the appropriate respirator and cartridges available.

Providing, cleaning and maintaining personal protective equipment

The supervising fumigant handler must ensure that all handlers *in the application block and the surrounding buffer zone* are provided with and correctly wear the required personal protective equipment. The personal protective equipment must be cleaned and maintained.

Respiratory Protection and Stop Work Triggers:

The following air monitoring procedures must be followed to determine whether respiratory protection is required, or if operations must cease, for any person performing a fumigant handling task as defined on this label.

- If at any time any handler experiences sensory irritation (tearing, burning of the eyes or nose) when not wearing a respirator then either:
 - an air-purifying respirator must be worn by all handlers who remain in the application block and surrounding buffer zone, and air monitoring samples must be collected at least every 2 hours in the breathing zone of a handler performing a representative handling task; or
 - operations must cease and handlers not wearing respiratory protection must leave the application block and surrounding buffer zone.

- Handlers can remove respirators or resume operations provided:
 - two consecutive breathing-zone samples taken at the handling site at least 15 minutes apart show that levels of methyl isothiocyanate (MITC) have decreased to less than 600 ppb at the location where the irritation was first experienced; and
 - handlers do not experience sensory irritation.
 - IMPORTANT: See requirements in the *Fumigant Air Monitoring* section of this label.
- If at any time any handler experiences any sensory irritation when wearing a respirator or an air sample is greater than or equal to 6000 ppb MITC:
 - all handler activities must cease and handlers must be removed from the application block and surrounding buffer zone; and
 - the emergency plan detailed in the Fumigation Management Plan must be implemented.
- Handlers can resume work activities **with** appropriate respiratory protection provided all of the following conditions are met:
 - two consecutive breathing zone samples for MITC taken at least 15 minutes apart must be less than 6000 ppb at the location where the irritation was first experienced;
 - handlers do not experience sensory irritation while wearing the air purifying respirator;
 - respirator cartridges have been changed; and
 - air monitoring samples must be collected at least every 2 hours in the breathing zone of a handler performing a representative handling task.
 - IMPORTANT: See requirements in the *Fumigant Air Monitoring* section of this label.
- Handlers can resume work activities **without** respiratory protection provided all of the following conditions are met:
 - two consecutive breathing zone samples taken at the handling site at least 15 minutes apart show levels of MITC have decreased to less than 600 ppb, at the location where the irritation was first experienced; and
 - handlers do not experience sensory irritation.
 - IMPORTANT: See requirements in the *Fumigant Air Monitoring* section of this label.

Fumigant Air Monitoring

- When using monitoring devices to monitor air concentration levels, a direct reading detection device, such as a Draeger or Sensidyne device must be used. The devices must have a sensitivity of at least 600 ppb for MITC.
- During the collection of air samples an air-purifying respirator must be worn by the handler taking the air samples.
- The results of monitoring activities must be captured in the Fumigation Management Plan's post-application summary report.

IMPORTANT: See *Engineering Controls* section for more options.

Exclusion of Non Handlers from Application Block and Buffer Zone

The supervising fumigant handler and/or the owner/operator of the establishment where the fumigation is taking place must make sure that all persons who are not trained, not wearing personal protective equipment (PPE) or who are not performing one of the handling tasks defined in this labelling are:

- excluded from application block during the entry prohibition period, and
- excluded from the buffer zone during the re-entry interval.

Engineering controls for motorized ground equipment with an enclosed cab
Applicators using an enclosed cab may:

- wear long-sleeve shirt, long pants, boots and socks;
- if a respirator and eye protection are triggered by MITC air monitoring *either* wear the respirator and eye protection required in the PPE section for respirator and eye protection *or* use an enclosed cab that is declared in writing by the manufacturer or by a government agency to provide at least as much respiratory protection as this type of respirator;
- be provided, have immediately available for use, and wear in an emergency when they must exit the cab in the application block or surrounding buffer zone: coveralls and chemical-resistant gloves plus – if not already using one – the eye protection and respirator specified in the PPE section for respirator and eye protection; and
- take off any PPE that was worn before re-entering the cab, and store all such PPE in a chemical-resistant container, such as a plastic bag, to prevent contamination of the inside of the cab.

7.0 Label Amendments Pertaining to Application Methods

Add to DIRECTIONS FOR USE:

For the treatment of wooden poles/timbers:

1. Plug the pre-drilled holes immediately after applications;
2. Do not treat structures/beams indoors;

3. Do not drill an application hole through seasoning checks to apply product. If the hole intersects a check, plug the hole and drill another. If more than 2 treatment holes intersect an internal void or rot pocket, re-drill the holes farther up the pole into relatively solid wood.
4. DO NOT permit entry into the spill or leak area by any other person until the air concentration is measured to be less than 0.6 ppm MITC

For all the soil fumigant products:

Tarp Perforation and/or Removal

IMPORTANT: Persons perforating, repairing, removing, and/or monitoring tarps are defined, within certain time limitations, as fumigant handlers (see definition of fumigant handlers in this labelling) and must be provided the PPE and other protections for handlers as required on this label.

Tarps must not be perforated until a minimum of 5 days (120 hours) have elapsed after the fumigant injection into the soil is complete (for example, after injection of the fumigant product and tarps -- if used -- have been laid or after lines have been purged), unless an adverse weather condition exists which necessitates the need for early perforation or removal. See *Early Tarp Removal for Broadcast Applications Only* and *Early Tarp perforation for Flood Prevention Activities* sections.

If tarps will be removed before planting, tarp removal must not begin until at least 2 hours after tarp perforation is complete.

If tarps will NOT be removed before planting, planting or transplanting cannot begin until at least 48 hours after the tarp perforation is complete.

If tarps are left intact for a minimum of 14 days after fumigant injection into the soil is complete, planting or transplanting may take place while the tarps are being perforated.

Each tarp panel used for broadcast fumigation must be perforated.

Tarps used for fumigations may be perforated manually ONLY for the following situations:

- At the beginning of each row when a coulter blade (or other device which performs similarly) is used on a motorized vehicle such as an ATV
- In fields that are 0.4 hectare or less
- During flood prevention activities

In all other instances tarps must be perforated (cut, punched, poked, or sliced) only by mechanical methods.

Tarp perforation for broadcast fumigations must be completed before noon.

For broadcast fumigations, tarps must not be perforated if rainfall is expected within 12 hours.

Early Tarp Removal for Broadcast Applications

- Tarps may be removed prior to the required 5 days (120 hours) if adverse weather conditions have compromised the integrity of the tarp, provided that the compromised tarp poses a safety hazard. *Adverse weather* includes high wind, hail or storms that blow tarps off the field and create a hazard, e.g., tarps blowing into power lines and onto roads. A *compromised tarp* is a tarp that due to an adverse weather condition is no longer performing its intended function and is creating a hazard.
- If tarps are removed before the required 5 days have elapsed due to adverse weather, the events must be documented in the post-application summary report section of the Fumigation Management Plan.

Early Tarp Perforation for Flood Prevention Activities

- Tarp perforation is allowed before 5 day (120 hours) have elapsed if rain necessitates field drainage.
- Tarps must be immediately retucked and packed after soil removal.

Entry Restricted Period

Entry (including early entry) by any person – other than a correctly trained and PPE-equipped handler who is performing a handling task listed on this labelling is – PROHIBITED – from the start of the application until:

- 5 days (120 hours) after application has ended for untarped applications, or
- 5 days (120 hours) after application is complete if tarps are not perforated and removed for at least 14 days following application, or
- 48 hours after tarp perforation is complete if they will not be removed for at least 14 days following application, or
- until tarp removal is completed if tarps are both perforated and removed less than 14 days after application.

NOTE: see *Tarp Perforation and Removal* section on this labelling for requirements about when tarps are allowed to be perforated.

8.0 Label Amendments Pertaining to Buffer Zone Requirements for the Soil Fumigant Products

The DIRECTIONS FOR USE section of the soil fumigant product labels must include buffer zone tables. The buffer zone tables, based on the following tables, must only reference registered uses, application rates and application method specific to each product label.

Table 1 Metam sodium and metam potassium buffer zone distances (metres) for center pivot irrigation application (high release) broadcast application method.

Block Size (hectare)	Broadcast equivalent application rate (kg a.i./ha)														
	35	65	90	110	135	155	180	200	225	245	270	290	315	335	360
1	15	25	40	50	55	60	65	70	75	80	85	90	90	95	100
2	15	30	45	55	70	80	90	95	100	100	100	100	125	125	125
4	15	30	45	60	75	90	100	125	125	125	125	150	150	175	175
8	25	40	60	75	90	100	125	125	150	175	175	200	225	225	250
10	25	40	60	80	100	125	150	175	200	225	250	250	275	300	300
15	30	60	90	100	125	150	175	200	225	250	275	300	325	350	375
20	30	60	90	125	150	175	200	225	250	275	300	325	375	400	425
25	60	90	125	150	175	200	225	250	300	325	375	400	425	450	500
30	60	90	125	150	175	225	250	300	325	375	425	450	500	525	550
35	80	100	125	175	200	225	250	300	350	400	425	450	500	525	550
40	90	125	150	175	225	250	275	325	375	400	450	500	525	575	600
45	100	125	175	200	225	250	300	325	375	425	475	525	550	600	650
50	125	150	175	225	250	275	300	350	400	450	500	525	575	625	675
55	175	225	250	275	300	325	375	400	450	500	550	600	650	675	725
65	250	275	300	325	375	400	425	475	525	575	600	650	700	750	800

Table 2 Metam sodium and metam potassium buffer zone distances (metres) for center pivot irrigation application (medium release) application method

Block Size (hectare)	Broadcast equivalent application rate (kg a.i./ha)														
	35	65	90	110	135	155	180	200	225	245	270	290	315	335	360
1	10	10	10	10	15	20	25	25	30	35	40	40	45	50	55
2	10	10	15	20	25	25	30	35	40	40	45	80	55	55	60
4	10	15	25	30	35	40	45	55	60	70	75	90	100	100	125
8	10	15	25	35	40	50	60	75	90	100	125	125	150	175	175
10	10	15	25	40	55	70	85	100	125	150	175	200	225	225	250
15	15	25	30	50	70	90	100	125	150	175	225	225	250	275	300
20	15	25	30	55	80	100	125	150	175	225	250	275	300	325	375
25	25	40	60	85	100	125	150	200	225	275	300	325	375	400	425
30	25	40	60	90	125	150	175	225	275	325	375	400	425	450	500
35	30	50	75	100	125	175	200	250	300	325	375	425	450	475	525
40	30	60	90	125	150	175	225	250	300	350	400	425	475	500	550
45	45	75	100	125	175	200	225	275	325	375	400	454	500	525	575
50	60	90	125	150	175	225	250	300	325	375	425	475	525	550	600

Table 3 Metam sodium and metam potassium buffer zone distances (metres) for center pivot irrigation application (low release) application method.

Block Size (hectare)	Broadcast equivalent application rate (kg a.i./ha)														
	35	65	90	110	135	155	180	200	225	245	270	290	315	335	360
1	10	10	10	10	10	10	15	20	20	25	30	400	45	50	55
2	10	10	10	10	15	20	25	30	35	40	45	50	55	55	60
4	10	10	15	20	25	25	30	40	45	55	60	70	75	85	90
8	10	10	15	20	25	35	40	50	60	70	75	90	100	100	125
10	10	10	15	25	30	40	45	60	70	80	90	100	125	125	150
15	10	15	25	35	40	50	60	75	85	95	100	125	150	175	175
20	10	15	25	35	50	65	75	90	100	125	125	150	175	200	225
25	15	25	30	45	60	75	90	100	125	150	175	175	200	225	250
30	25	40	55	70	90	100	125	150	175	200	225	225	250	275	300
35	25	40	55	75	100	125	125	150	175	200	225	250	275	300	325
40	30	45	60	85	100	125	150	175	200	225	250	275	300	350	375
45	40	55	75	100	125	150	175	200	225	250	275	300	350	375	400
50	45	70	90	125	125	150	175	225	250	275	300	325	375	400	425

Table 4 Metam sodium and metam potassium buffer zone distances (metres) for chemigation (all except center pivot) and flood applications.

Block Size (hectare)	Broadcast equivalent application rate (kg a.i./ha)														
	35	65	90	110	135	155	180	200	225	245	270	290	315	335	360
1	10	10	15	20	20	25	25	30	30	35	40	60	45	50	50
2	10	10	15	20	25	25	30	35	40	40	45	80	55	55	60
3	10	15	20	25	30	35	40	45	45	60	65	85	80	90	100
4	10	15	25	30	35	40	45	55	60	70	75	90	100	100	125
8	10	15	25	35	40	50	60	75	90	100	125	125	150	175	175
10	10	15	25	40	55	70	85	100	125	150	175	200	225	225	250
15	15	25	30	50	70	90	100	125	150	175	225	225	250	275	300
20	15	25	30	55	80	100	125	150	175	225	250	275	300	325	375
25	25	40	60	85	100	125	150	200	225	275	300	325	375	400	425
30	25	40	60	90	125	150	175	225	275	325	375	400	425	450	500
35	25	50	75	100	125	175	200	250	300	325	325	425	450	475	525
40	30	60	90	125	150	175	225	250	300	350	400	425	475	500	550
45	45	75	100	125	175	200	225	275	325	375	400	450	500	525	575
50	60	90	125	150	175	225	250	300	325	375	425	475	525	550	600

Table 5 Metam sodium and metam potassium buffer zone distances (metres) for tractor drawn rotary tiller and spray blade applications – tarped and untarped methods.

Block Size (hectare)	Broadcast equivalent application rate (kg a.i./ha)														
	35	60	90	110	135	155	180	200	225	245	270	290	315	335	360
2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
4	10	10	10	10	10	10	10	10	10	10	10	10	15	15	20
8	10	10	10	10	10	10	10	10	10	10	10	15	20	30	35
10	10	10	10	10	10	10	10	10	10	10	10	20	30	45	55
15	10	10	10	10	10	10	10	10	10	10	10	25	40	85	70
20	10	10	10	10	10	10	10	15	20	25	25	40	55	70	80
25	10	10	10	10	10	10	10	15	25	35	45	55	70	80	90
30	10	10	10	10	10	10	10	20	35	50	65	75	85	100	100

Table 6 Metam sodium and metam potassium buffer zone distances (metres) for tractor drawn shank injection applications – tarped and untarped methods

Block Size (hectares)	Broadcast equivalent application rate (kg a.i./ha)																
	35	49	65	76	90	110	135	155	180	200	225	250	270	290	315	335	360
1	10	10	10	10	10	10	10	10	10	10	10	15	15	20	20	25	25
2	10	10	10	10	10	10	10	10	10	10	10	15	15	20	25	25	30
4	10	10	10	10	10	10	10	10	15	20	25	25	30	40	45	55	60
8	10	10	10	10	10	10	10	15	15	20	25	40	55	65	75	80	90
10	10	10	10	15	15	15	20	15	20	35	45	55	70	80	90	100	100
15	10	10	10	15	15	25	20	20	20	35	50	65	75	90	100	100	125
20	10	10	15	20	25	25	25	20	30	45	60	75	90	100	125	125	152
25	10	10	15	20	25	25	25	30	30	50	70	90	100	125	150	150	175
30	15	20	25	25	30	40	45	45	55	75	90	100	125	150	175	200	225
35	20	25	25	30	35	40	50	60	55	80	95	125	125	150	175	200	225
40	25	25	30	35	40	45	55	65	60	85	100	125	125	150	175	200	225
45	25	30	35	35	40	50	55	70	65	90	100	125	150	175	200	225	225
50	25	30	35	40	45	55	60	75	70	95	125	125	150	175	200	225	250

Add to DIRECTIONS FOR USE:

Buffer Zones

A "buffer zone" must be established for every fumigant application. The following describes the general buffer zone requirements:

- "Buffer zone" is an area established around the perimeter of each application block or greenhouse where a soil fumigant is applied. The buffer zone must extend from the edge of the application block perimeter equally in all directions.
- All non-handlers including field workers, nearby residents, pedestrians, and other bystanders, must be excluded from the buffer zone during the re-entry interval except for certain persons in transit (see the *Exemptions for Transit Through Buffer Zones* section).
- The "re-entry interval" starts at the moment when any fumigant is delivered/dispensed to the soil within the application block and lasts for a minimum of 48 hours after the fumigant has stopped being delivered/dispensed to the soil.
- An "application block" is a greenhouse, field or portion of a field treated with a fumigant in any 24-hour period (see Figures 1 and 2 for further explanation). See exception provide in the *Buffer Zone Proximity* section.

Buffer Zone Proximity

Before the application begins, the supervising fumigant handler must determine whether the application block or its resulting buffer will overlap with a buffer that is already in effect.

For all applications except Low Release Height-Solid Stream Centre Pivot:

To reduce the potential for off-site movement from multiple fumigated fields, buffer zones from multiple metam sodium and metam potassium application blocks may not overlap **UNLESS**:

- A minimum of 12 hours has elapsed from the time the earlier application ends until the subsequent application begins, and
- Emergency preparedness and response measures specified in the Fumigation Management Plan have been implemented if there are any homes, businesses, or property not within the control of the owner/operator within 90 metres of each buffer zone.

For Low Release Height-Solid Stream Centre Pivot Applications:

To reduce the potential for off-site movement from multiple fumigated fields, buffer zones from multiple metam sodium and metam potassium application blocks may not overlap **UNLESS**:

- Both application blocks are treated using low release height-solid stream centre pivot systems. The 12 hour waiting period does not apply in this instance.
- Emergency preparedness and response measures specified in the label have been implemented if there are any homes, businesses or property not within the control of the fumigator within 90 metres of each buffer zone

Authorized Entry to Buffer Zones

Only authorized handlers may be in the buffer zone during the re-entry interval. All non-handlers including field workers, nearby residents, pedestrians, and other bystanders, must be excluded from the buffer zone during the re-entry interval except for certain persons in transit (see the *Exemptions for Transit Through Buffer Zones* section).

Exemptions for Transit Through Buffer Zones

Vehicular and bicycle traffic on public and private roadways through the buffer zone is permitted. "Roadway" means that portion of a street or highway improved, designed or ordinarily used for vehicular travel, exclusive of the sidewalk or shoulder even though such sidewalk or shoulder is used by persons riding bicycles. In the event a highway includes two or more separated roadways, the term "roadway" shall refer to any such roadway separately.

Bus stops or other locations where persons wait for public transit are not permitted within the buffer zone. See the Notification and Posting section of the Fumigation Managerment Plan for additional requirements that may apply.

Structures Under the Control of Owner/Operator of the Application Block

Buffer zones may not include buildings used for storage such as sheds, barns, garages, etc., **UNLESS**,

1. The storage buildings are not occupied during the re-entry interval, and
 2. The storage buildings do not share a common wall with an occupied structure.
- See the *Posting Requirements* section for additional requirements that may apply.

Areas Not Under the Control of Owner/Operator of the Application Block

Buffer zones may not include residential areas (including employee housing, private property, buildings, commercial industrial and other areas that people may occupy or outdoor residential areas, such as lawns, gardens or play areas) **UNLESS**,

1. The occupants provide written agreement to the supervising fumigant handler that they will voluntarily vacate the buffer zone during the entire re-entry interval, and
2. Re-entry by occupants and other non-handlers must not occur until,
 - The re-entry interval has ended, and
 - Sensory irritation is not experienced

Buffer zones may not include agricultural areas owned/operated by persons other than the owner/operator of the application block, **UNLESS**,

1. The owner/operator of the application block can ensure that the buffer zone will not overlap with a buffer zone from any adjacent property owner except as provided for above, and
2. The owner/operator of the areas (i.e., area that are not under the control of owner/operator of the application block) provides written agreement to the supervising fumigant handler that they, their employees, and other persons will stay out of the buffer zone during the entire re-entry interval.

Buffer zones must not include roads and rights of way UNLESS,

1. The area is not occupied during the re-entry interval,
2. Entry by non-handlers is prohibited during the re-entry interval, and

For all other publicly owned and/or operated areas such as parks, sidewalks, walking paths, playgrounds, and athletic fields, buffer zones must not include these areas UNLESS,

1. The area is not occupied during the re-entry interval,
 2. Entry by non-handlers is prohibited during the re-entry interval, and
 3. Written permission to include the public area in the buffer zone is granted to the supervising fumigant handler and/or the owner/operator by the appropriate local/provincial/territorial/federal authorities responsible for management and operation of the area.
- See the *Posting Requirements* section in the Fumigation Management Plan for additional restrictions that may apply.
 - It is the responsibility of the supervising fumigant handler to record all communications pertaining to areas not under control of the owner/operator in the Fumigation Management Plan.

Difficult to Evacuate Sites

Difficult-to-evacuate sites include schools (preschool to grade 12), provincial licensed daycare centers, nursing homes, assisted living facilities, hospitals, in-patient clinics, and prisons.

- No fumigant application with a buffer zone greater than 90 metres is permitted within 400 metres of the sites listed above unless the site is not occupied during the application and the 36-hour period following the start of application.
- No fumigant application with a buffer zone of 90 metres or less is permitted within 200 metres of the sites listed above unless the site is not occupied during the application and the 36-hour period following the start of application

Buffer Zone Distances

Buffer zone distances must be calculated using the application rate and the size of the application block.

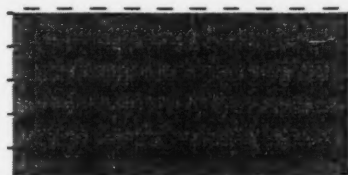


Figure 1. Broadcast Application

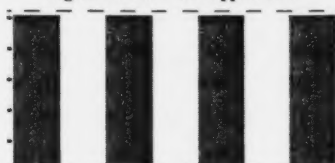


Figure 2. Bedded Application

In **Figures 1 and 2**, the dashed line represents the perimeter of the field, the shaded area is the portion of the field that is treated, and the un-shaded area is the area of the field that is untreated. Assuming both fields are one hectare, and only 50% of field in Figure 2 is fumigated, the rate per treated hectare is 300 kg a.i./ha for both Figure 1 and 2. The broadcast rate for Figure 1 is 300 kg a.i./ha but the effective broadcast equivalent rate for Figure 2 is 150 kg a.i./ha. The buffer zone distances must be based on the broadcast or effective broadcast equivalent rates.

Note to registrant: Labels may express rates as kg per treated hectare under the application instructions but they must identify buffer zone distances based on the broadcast or effective broadcast equivalent rates.

Ten (10) metres is the minimum buffer distance regardless of site-specific application parameters.

If the buffer zone, after applying all applicable buffer zone credits is larger than 0.8 km (800 metres) then the application is prohibited.

For all metam sodium and metam potassium soil applications, the buffer zone tables must be used to determine the minimum buffer zone distances. Round-up to the nearest rate and block size, where applicable.

Buffer Zone Credits

The buffer zone distances for metam sodium and metam potassium applications may be reduced by the percentages listed below. Credits may be added, but credits may not exceed 80%. **IMPORTANT:** the minimum buffer zone distance is 10 metres regardless of available buffer zone credits.

- 30% reduction in buffer zone distance, IF the organic content of soil in the application block is greater than 3%. 20% reduction in buffer zone distance, IF the organic content of soil in the application block is between 3% and 2%. 10% reduction in the buffer zone distance, IF the organic content of soil in the application block is between 2% and 1%. Record the measurements taken to verify the organic content in the Fumigant Management Plan. No Credit will be given for soils with less than 1% organic content.
- 10% reduction in buffer zone distance, IF the clay content of the soil in the application block is greater than 27%. Record the measurements taken to verify the clay content in the Fumigant Management Plan.
- For center pivot irrigation and shank applications: 20% reduction in buffer zone distance, IF the soil temperature in the application block is less than 10 degrees Celsius. 10% reduction in buffer zone distance, IF the soil temperature in the application block is between 10 and 21 degrees Celsius. Record measurements taken to verify the soil temperature in the Fumigant Management Plan.
- For flood irrigation and rotary tiller and spray blade applications: 10% reduction in the buffer zone, IF the soil temperature in the application block is between 10 and 21 degrees Celsius. Record the measurements taken to verify the soil temperature in the Fumigant Management Plan.
- 30% buffer credit is appropriate for the following high-barrier tarps: Olefinas Embossed VIF, Klerks VIF, Pliant Blockade, Bromostop® (1.38 mil), Eval.Mitsui TIF (1.38mil), Hytiblock 7 Black (0.00125"), XL Black Blockade (0.00125"), Hytibar (1.5 mil), and IPM Clear VIF (1.38 mil). A 15% buffer credit is appropriate for the following high-barrier tarps: Canslit Heatstrip and Canslit Metalized. Record the information to verify tarp type in the Fumigant Management Plan (tarp brand name, manufacturer, lot number, batch number, part number and thickness).

Example of buffer calculation if a credit is applicable

For example, if the buffer zone is 15 metres and the application qualifies for a buffer zone reduction credit since the soil organic content is between 1% and 2%. Then, the buffer zone can be reduced by 10%, i.e., reduced by 1.5 metres based on the following calculation: 15 metres – (15 metres × 10%) = 13.5 metres.

9.0 Label amendments pertaining to Good Agricultural Practice requirements

Add to DIRECTIONS FOR USE:

The following Good Agricultural Practices must be followed during all fumigant applications. All measurements and other documentation planned to ensure that the mandatory Good Agricultural Practices are achieved must be recorded in the Fumigation Management Plan.

IMPORTANT: See additional specific Good Agricultural Practice requirements for sprinkler and chemigation applications.

Weather Conditions

- Prior to fumigation the weather forecast for the day of the application and the 48-hour period following the fumigant application must be checked to determine if unfavourable weather conditions exist or are predicted and whether fumigation should proceed.
- Wind speed must be at a minimum of 3 km/h at the start of the application or forecast to reach at least 8 km/h during the application.
- Do not apply if a shallow, compressed (low-level) temperature inversion is forecast to persist for more than 18 consecutive hours for the 48-hour period after the start of application, or if there is an air-stagnation advisory in effect for the area in which the fumigation is planned (see *Identifying Unfavourable Weather Conditions* section).

Identifying Unfavourable Weather Conditions

- Unfavourable weather conditions block the upward movement of air, which results in trapping fumigant vapours near the ground. The resulting air mass can move off-site in unpredictable directions and cause injury to humans, animals or property. These conditions typically exist prior to sunset and continue past sunrise and persist as late as noontime. Unfavourable conditions are common on nights with limited cloud cover and light to no wind and their presence can be indicated by ground fog or smog and can also be identified by smoke from a ground source that flattens out below a ceiling layer and moves laterally in a concentrated cloud.

Soil Preparation

- The soil shall be properly prepared and free of large clods that are golf ball size or larger at the surface. If subsurface soil compaction layers (hardpans) are present within the intended fumigation treatment zone, a deep tillage to fracture these layers must occur prior to the soil fumigant.
- Field residue and stubble must be worked into the soil to allow for decomposition, with little or no crop residue present on the soil surface. Crop residue that is present must not interfere with the soil seal. Removing the crop residue prior to fumigation is important to limit the natural "chimneys" that will occur in the soil when crop residue is present. These "chimneys" allow the soil fumigants to move through the soil quickly and escape into the atmosphere. This may create potentially harmful conditions for workers and bystanders and will limit the efficacy of the fumigant. However crop residue on the field serves to prevent soil erosion from both wind and water and is an important consideration. To accommodate erosion control, fumigant efficacy, and human health protection, clear fields of crop residue as close to the timing of the fumigation as possible to limit the length of time that the soil would be exposed to potentially erosive weather conditions.
- For shank injection applications: The injection point for bedded and broadcast shank injection applications shall be a minimum of 3 inches from the post-application soil surface. Chisel traces must be eliminated following an application and the soil surface must be compacted immediately with a culti-packer, ring roller, soil-crumbler basket, bed-shaper, or other similar equipment.

- For spray blade and rotary tiller applications: spray or drip the product mixture on the soil immediately ahead of the bed-shaping equipment or tiller. The soil surface must be compacted immediately after application using a culti-packer, ring roller, soil-crumblor basket, bed-shaper, or other similar equipment.

Soil Temperature

- The maximum soil temperature measured at a three inch soil depth is 32 °C at the beginning of the application. If air temperatures have been above 37°C for more than three hours in any of the three days prior to application, then soil temperature shall be measured and recorded in the Fumigation Management Plan.

Soil Moisture

- Soil moisture, at the start of application, must be at 60-80% field capacity 5-15 cm below the soil surface.
 - The USDA Feel and Appearance Method for testing. Surface soil dries rapidly and must not be considered in this determination. Please refer to the following document for further instructions:
<http://nmp.tamu.edu/content/tools/estimatingsoilmoisture.pdf>
 - An instrument, such as a tensiometer
- To achieve soil moisture at 60-80% field capacity, water treatments before or during application may be necessary.
- To conserve soil moisture, pre-treatment water or tillage should be done as close to the time of application as possible.

For injection applications:

In addition to the Good Agricultural Practices required for all metam sodium and metam potassium soil fumigation applications, the following Good Agricultural Practices apply for metam sodium and metam potassium injection applications:

Tarps (when tarps are used)

Tarps must be installed immediately after the fumigant is applied to the soil.

Soil Preparation

Trash pulled by the shanks to the ends of the field must be covered with tarp, or soil, depending on the application method before making the turn for the next pass.

Application Depth

- *For Tarped-Broadcast and Tarped-Bedded Applications:* The injection point shall be a minimum of 20 cm from the nearest final soil/air interface.
- *For Untarped-Bedded Applications:* The injection point shall be a minimum of 30 cm from the nearest final soil/air interface.
- *For Untarped-Broadcast Applications:* The injection point shall be a minimum of 25 cm from the nearest final soil/air interface.

Soil Sealing

- *For Broadcast Untarped Applications:* Use a disc or similar equipment to uniformly mix the soil to at least a depth of 8-10 cm to eliminate the chisel or plow traces. Following elimination of the chisel trace, the soil surface must be compacted with a cultipacker, ring roller and roller in combination with tillage equipment.
- *For Bedded Applications:* Preformed beds shall be sealed by disruption of the chisel trace using press sealers, bed shapers, cultipackers, or by re-shaping (relisting, lifting and replacing, etc.) the beds immediately following injection. Beds formed at the time of application shall be sealed by disrupting the chisel trace using press sealers, or bed shapers.
- *Soil Sealing for Tarped Applications:* The use of a tarp does not eliminate the need to minimize chisel traces prior to application of the tarp, such as by using a nobel plow or other injection shank that disrupts the chisel traces.

Prevention of End Row Spillage

- Do not apply or allow fumigant to drain onto the soil surface. For each injection line either have a check valve located as close as possible to the final injection point, or drain/purge the line of any remaining fumigant prior to lifting injection shanks from the ground.
- Do not lift injection shanks from the soil until the shut-off valve has been closed and the fumigant has been depressurized (passively drained) or purged (actively forced out via air compressor) from the system.

Application and Equipment Considerations

- Injectors must be placed below the soil surface before product flow begins.
- Clear lines before lifting injectors from the soil.
- Each injection line must have a check valve located as close as possible to the final injection point.
- Use only tanks, hoses and fittings approved for Metam
- Dry connect fittings (closed transfer system) must be installed on all tanks and transfer hoses.
- All systems must be equipped with an individual tank monitoring system to detect flow problems in each individual tank
- Each nozzle must be equipped with a flow monitor, for example, mechanical, electronic or Red-ball type monitor.
- Prior to applications, the supervising fumigant handler must ensure that:
 - Application equipment is in good working order,
 - All tanks, hoses, fittings, valves and connections are tightened, sealed and not leaking,
 - Tank monitoring equipment, flow monitoring equipment and check valves are functioning properly,
 - There is no damage to hoses or piping, sight gauges and pressure gauges are working,
 - Nozzles and metering devices are of correct size and are sealed and unobstructed,
 - All shields are in place.

Tarps

- When tarps are used in tractor applications, the tarps must be installed immediately after application.
- Only approved tarps identified in this document, in the section titled "Buffer Zone Reduction Credits", may be used for credits towards reducing the buffer.
- A written tarp plan must be developed and included in the Fumigation Management Plan that includes:
 - Schedule and procedures for checking tarpaulins for damage, tears, and other problems,
 - Plans for determining when and how repairs to tarp will be made, and by whom,
 - Minimum time following injection that tarp will be repaired,
 - Minimum size of damage that will be repaired,
 - Other factors used to determine when tarp repair will be conducted,
 - Schedule, equipment and methods to cut the tarp,
 - Aeration plans and procedures following cutting and/or slitting prior to tarp removal or planting, and
 - Schedule, equipment, and procedures for tarp removal.

Good Agricultural Practices Pertaining to Sprinkler and Chemigation Applications**Wind Speed**

- For mid-release, high-release and end-gun sprinkler or chemigation applications, wind speed at the application site must be a minimum of 3 km per hour at the start of application or forecasted to reach 8 km per hour during the application and the maximum wind speed is 13 km per hour.
- For low release height-solid stream and end-gun sprinkler or chemigation applications, wind speed at the application site must be a minimum of 3 km per hour at the start of application or forecasted to reach 8 km per hour during the application and the maximum wind speed is 40 km per hour.

Air temperature

- *For All Chemigation Applications:* The maximum air temperature shall not exceed 32°C during the application.
- In addition, it is anticipated that the atmosphere will routinely be stagnant early in the morning in certain regions and times of year before temperatures rise over the course of a day which will alleviate such conditions. If this cyclical atmospheric regime is forecasted, then fumigant applications may be executed. However, as under all conditions, buffer zones must be adhered to.

Flushing Irrigation Lines

- *For Chemigation Applications:* Do not allow fumigant to remain in the irrigation system after the application is complete. After application of the fumigant, flush the injection and irrigation system with untreated water. The flush time must be adequate to purge the fumigant from the injection and irrigation systems, but should be less than the amount that could over saturate the beds. If common lines are used for the fumigant application and the water treatment/seal (if applied), these lines must be adequately flushed before starting the water treatment/seal.

Set-up, Repair and Maintenance of Equipment

- Anti-siphon and back-flow prevention devices must be installed and in working order.
- Storage tanks must be inspected, in good condition, and not past their life expectancy to ensure product does not spill or leak.
- Storage tanks must have proper pesticide labels on them.
- Install a shut-off valve on the tank outlet to secure bulk storage tank when not in use.
- Use only tanks constructed with materials approved for handling metam sodium and metam potassium.
- Inter-connect the pump power supply and injection pump so that, if the center pivot or linear move stops, the injection pump shuts off.

10.0 Additional label amendments for the soil fumigant products

Add to DIRECTIONS FOR USE:

Posting Requirements

The applicator must verbally warn workers and placard or post bilingual warning signs on all entrances to the fumigated area and/or the application block (i.e., field or portion of a field treated with a fumigant in any 24-hour period). These signs must be posted at eye level and must be visible from all visible points of entry to the treated area. They must remain posted during application and throughout the restricted re-entry interval.

All warning signs must conform to the following requirements:

- The printed side of the sign must face away from the treated area toward areas from which people can approach.
- Signs must be clearly legible during entire posting period. The sign shall be at least 35 cm by 25 cm in size and the letters shall be at least 7 cm in height unless a smaller-sized sign is necessary because the treated area is too small to accommodate a sign of this size.
- Signs must be posted before the application begins and remain posted until the re-entry interval has expired.
- Signs must be removed within 3 days after the end of the re-entry interval.
- Registrants must provide generic warning signs which meet the criteria above at points of sale for applicators to use.
- Only a supervising fumigant handler (or someone under his/her supervision) may remove warning signs.

Warning signs for the **buffer zone** must:

- Be placed at all usual points of entry and along likely routes of approach from areas where people not under the land operator's control may approach the buffer zone.
 - Some examples of points of entry include, but are not limited to, roadways, sidewalks, paths and bike trails.
 - Some examples of likely routes of approach are the area between a buffer zone and a roadway, or the area between a buffer zone and a housing development.
 - Posting of warning signs for the fumigation **buffer zone** is required, **unless** there is a physical barrier that prevents bystander access into the buffer zone.
 - Exception: If multiple contiguous blocks are fumigated within a 14-day period, the entire periphery of the contiguous blocks' buffer zones may be posted. The signs must remain posted until the last re-entry interval expires and signs may remain posted until 3 days after the re-entry interval for the last block has expired.

The warning signs for the **buffer zone** must bear the following:

- Do not walk sign
- "DO NOT ENTER"
- "Metam sodium or metam potassium (as applicable) [name of product] Fumigant BUFFER ZONE"
- Contact information for the supervising fumigant handler in charge of the fumigation

The warning signs for the **treated area** must:

- Remain posted for no less than the duration of the re-entry interval after treatment.
- Be removed within 3 days after the end of the re-entry interval.

Emergency Preparedness and Response

If any of the following conditions apply, the supervising fumigant handler must either follow the directions for "**Fumigant Site Monitoring**" or follow the directions for "**Response Information for Neighbours**".

- Buffer zone is greater than **10 metres** and less than or equal to **30 metres**, and there are residences and businesses within **15 metres** from the edge of the buffer zone; or,
- Buffer zone is greater than **30 metres** and less than or equal to **60 metres**, and there are residences and businesses within **30 metres** from the edge of the buffer zone; or,
- Buffer zone is greater than **60 metres** and less than or equal to **90 metres**, and there are residences and businesses within **60 metres** from the edge of the buffer zone; or,
- Buffer zone is greater than **90 metres** or the **buffer zones overlap**, and there are residences and businesses within **90 metres from the edge of the buffer zone**.

If the buffer zone is **10 metres** then the Emergency Preparedness and Response requirements are not applicable.

Fumigation Site Monitoring

From the beginning of the fumigant application until the re-entry interval expires, a supervising fumigant handler or someone under his/her supervision must monitor the air concentration levels of the fumigant in the area between the buffer zone perimeter and the areas (such as residences or businesses) that trigger this requirement.

Monitoring the air concentration levels must begin in the evening on the day of application and continue until the re-entry interval expires with a minimum of at least 8 samples during the re-entry interval, including these periods:

- Once, 1 hour before sunset,
- Once, during the night,
- Once, at 1 hour after sunrise, and
- Once, during the day.

If at any time the person monitoring the air concentrations experiences sensory irritation, then the emergency response plan stated in the Fumigation Management Plan must be immediately implemented.

If other problems occur, such as a tarp coming loose, then the appropriate control plan must be activated.

The location and results of the air monitoring must be recorded in the postapplication summary report.

Response Information for Neighbours

The supervising fumigant handler (or someone under his/her supervision) must ensure that residences and owners/operators of businesses that meet the criteria have been provided the emergency response information at least **1 week** before fumigation occurs.

Information that must be included:

- The general location of the application block.
- The fumigant(s) applied including the active ingredient, name of the fumigant product(s) and the Product Registration Number.
- Contact information for the supervising fumigant handler and property owner/operator.
- Time period in which the fumigation is planned to take place (must not range more than 4 weeks).
- Early signs and symptoms of exposure to the fumigant(s) applied, what to do and who to call if you believe you are being exposed (911 in most cases).
- How to find additional information about fumigants.

- The method used to share the response information for neighbours must be described in the Fumigation Management Plan and may be accomplished through mail, door hangers, or through other methods that will effectively inform people in residences and businesses within the required distance from the edge of the buffer zone.

11.0 Label amendments pertaining to the protection of the environment

For all antimicrobial uses:

Add to DIRECTIONS FOR USE:

DO NOT discharge effluent containing this product into sewer systems, lakes, streams, ponds, estuaries, oceans or other waters.

Add to ENVIRONMENTAL HAZARD:

Toxic to aquatic organisms

For the wood treatment uses:

Add to DIRECTIONS FOR USE:

DO NOT apply this product to wood that will be used in water.

For the soil fumigant uses:

Add to DIRECTIONS FOR USE:

As this product is not registered for the control of pests in aquatic systems, DO NOT use to control aquatic pests. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

DO NOT apply this product through any other type of irrigation system.

DO NOT apply when wind speed causes non-uniform distribution and/or favours drift beyond the area intended for treatment

Add to ENVIRONMENTAL HAZARD:

TOXIC to aquatic organisms.

To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil or clay.

Avoid application when heavy rain is forecast.

Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (for example, sandy soil) and/or the depth to the water table is shallow.

For the soil fumigant products with greenhouse uses:

DO NOT allow effluent or runoff from greenhouses containing this product to enter lakes, streams, ponds or other waters.

Appendix III The Minimum Requirements for Fumigation Management Plan

Each site-specific Fumigation Management Plan must contain the following elements:

- 1) Applicator information (name, phone number, license number, employer name, employer address, date of completing the appropriate provincial/territorial pesticide applicator certification program.
- 2) General site information:
 - Application block location, address or global positioning system (GPS) coordinates.
 - Name, address, and phone number of owner/operator of the application block.
 - Map, aerial photo, or detailed sketch showing field location, dimensions, buffer zones, property lines, roads, rights-of-ways, sidewalks, permanent walking paths, bus stops, water bodies, wells, nearby application blocks, surrounding structures (occupied and non-occupied), locations of posted signs for buffers, and sites requiring 200-metre to 400-metre buffer zones (for example, schools, day care establishments, nursing homes, assisted living facilities, hospitals, in-patient clinics, and prisons) with distances from the application site labelled.
- 3) General application information:
 - Target application date/window
 - Brand name of fumigant
 - Product Registration Number
- 4) Tarp information and procedures for repair, perforation, and removal (if tarps are used):
 - Brand name, lot number, thickness
 - Name and phone number of person responsible for repairing tarps
 - Schedule for checking tarps for damage, tears, and other problems
 - Maximum time following notification of damage that the person(s) responsible for tarp repair will respond
 - Minimum time following application that tarp will be repaired
 - Minimum size of damage that will be repaired
 - Other factors used to determine when tarp repair will be conducted
 - Name and phone number of person responsible for cutting and/or removing tarps
 - Equipment/methods used to cut tarps
 - Schedule and target dates for cutting tarps
 - Schedule and target dates for removing tarps
- 5) Soil Conditions:
 - Description of soil texture in application block
 - Method used to determine soil moisture

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- 6) Weather Conditions:
 - Summary of forecasted conditions for the day of the application and the 48 hour period following the fumigant application
 - Wind speed
 - Inversion conditions (for example, shallow, compressed (low-level) temperature inversion)
 - Air stagnation advisory
 - 7) Buffer zones:
 - Application method
 - Application rate from look-up table on label (kilogram active ingredient per hectare)
 - Application block size from look-up table on label (hectares)
 - Credits applied
 - Buffer zone distance
 - Description of areas in the buffer zone that are not under the control of the owner/operator of the application block.
 - 8) Respirators and other personal protective equipment (PPE) for handlers (handler task, protective clothing, respirator type, respirator cartridge type, respirator cartridge replacement schedule, eye protection, gloves and other PPE).
 - 9) Emergency procedures:
 - Evacuation routes
 - Locations of telephones
 - Contact information for first responders
 - Local/provincial/territorial/federal contacts
 - Key personnel
 - Emergency procedures/responsibilities in case of an incident, equipment/tarp/seal failure, complaints or elevated air concentration levels outside buffer zone suggesting potential problems, or other emergencies.
 - 10) Posting requirements (names of persons who will post signs, location of posting signs and procedures for posting and sign removal).
 - 11) Emergency Preparedness and Response (if applicable):
 - Fumigant site monitoring
 - Description of who, when, where and procedures for monitoring buffer zone perimeter.
 - Response information from neighbours
 - List of residences, businesses and neighbouring property owners informed
 - Name and phone number of person doing notification
 - Method of providing information
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- 12) Description on how the communication will take place between applicator, land owner/operator, and other on-site handlers (tarp cutters/removers, irrigators, etc.) for complying with label requirements (for example, buffer zone location, buffer zone start/stop times, timing of tarp perforation and removal, personal protective equipment); including the name and phone number of persons contacted and the date contacted.
 - 13) Federal, provincial, territorial and local notification.
 - 14) Authorized on-site personnel:
 - Names, addresses and phone numbers of all handlers
 - Employer name, address and phone numbers for all handlers
 - Tasks that each handler is authorized and trained to perform
 - Date of training for each handler
 - 15) Air monitoring:
 - For buffer zone monitoring: (if applicable)
 - Name, address and phone number of handler to perform monitoring activities
 - Location and timing of monitoring for the buffer zone
 - For handlers without respiratory protection:
 - If sensory irritation is experienced, indicate whether operations will be ceased or operations will continue with respiratory protection
 - If intended to cease operations when sensory irritation is experienced, provide the name, address and phone number of the handler that will perform monitoring activities prior to operations resuming
 - For handlers with respiratory protection:
 - Representative handler tasks to be monitored
 - Monitoring equipment to be used and timing of monitoring
 - 16) Good Agricultural Practices (GAPs):
 - Description of applicable mandatory GAPs (registrants may also include optional GAPs)
 - Measurements and other documentation planned to ensure GAPs are achieved (for example, measurement of soil and other site conditions)
 - 17) Description of hazard communication:
 - The buffer zone around the application block has been posted in accordance with the label.
 - Pesticide product labels and material safety data sheets are on-site and readily available for employees to review.

18) Record keeping procedures:

- The owner/operator of the application block as well as the supervising fumigant handler must keep a signed copy of the site-specific Fumigation Management Plan and the post application summary for 2 years from the date of application.

19) Post-application Summary Report:

Date of the application, application rate and size of application block fumigated

Summary of weather conditions on the day of the application and during the 48-hour period following the fumigant application

Soil temperature measurement (if air temperatures were above 38 degrees Celsius in any of the 3 days prior to the application)

Tarp damage and repair information (if applicable)

- Location and size of tarp damage
- Description of tarp/tarp seal/tarp equipment failure
- Date and time of tarp repair

Tarp perforation/removal details (if applicable)

- Description of tarp removal (if different than in the Fumigation Management Plan)
- Date tarps were perforated
- Date tarps were removed

Complaint details (if applicable)

- Person filing complaint (for example, on-site handler, person off-site)
- If off-site person - name, address and phone number of person filing complaint
- Description of control measures or emergency procedures followed after complaint

Description of incidents, equipment failure or other emergency and emergency procedures followed (if applicable)

Details of elevated air concentrations monitored on-site (if applicable)

- Location of elevated air concentration levels
- Description of control measures or emergency procedures followed

Air monitoring results

- When sensory irritation experienced:
 - Date and time of sensory irritation
 - Handler task/activity
 - Handler location where irritation was observed
 - Resulting action (e.g., cease operations, continue operations with respiratory protection)

- When using a direct read instrument:

- Sample date and time
- Handler task/activity
- Handler location
- Air concentration
- Sampling method

Date of buffer zone sign removal

Any deviations from the Fumigation Management Plan